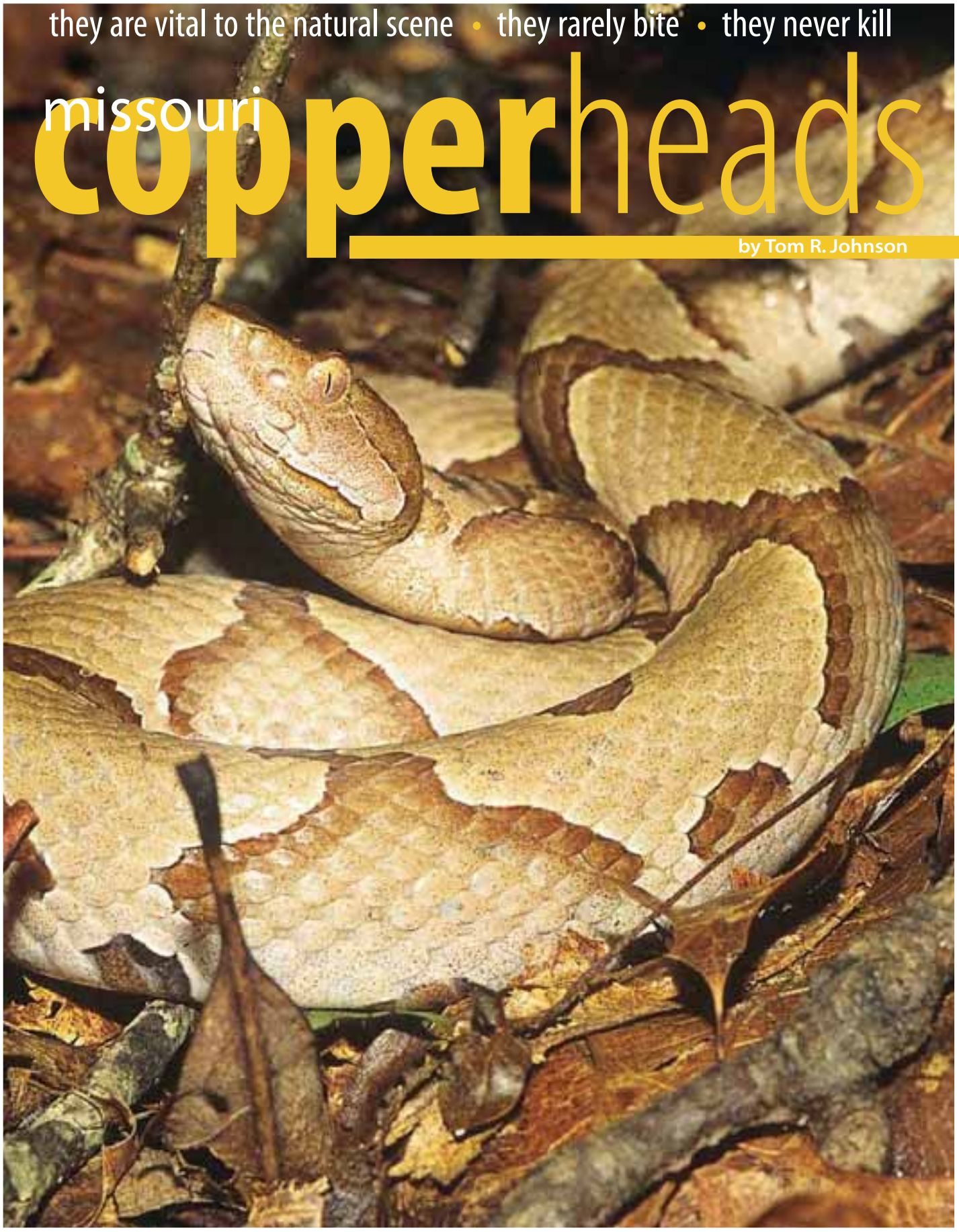
they are vital to the natural scene • they rarely bite • they never kill

missouri copperheads

by Tom R. Johnson



Jim Rathert

Copperheads, *Agkistrodon contortrix,*

belong to a subfamily of venomous snakes known as pit vipers, which also includes the cottonmouth and rattlesnakes. An important characteristic they share with other pit vipers are infrared-sensing facial pits, which are small openings between the eye and nostril on each side of the head. These pits assist in locating warm-blooded prey, such as mice.

Look into a pit viper's eyes and you'll see pupils shaped like a cat's—vertical and elliptical. All venomous snakes in Missouri—including copperheads—are pit vipers. If you see a snake with round pupils, it is a nonvenomous species. Copperheads and other members of their family have hollow, folding fangs located on the forward part of their upper jaw that allow them to inject venom into their prey.

Copperheads and their relatives (members of the genus *Agkistrodon*) have a wide distribution, with species living in Asia, Malaysia, southeastern Europe, North America and Central and South America. In the U.S., copperheads range from southern New England to northern Florida and west to southern Indiana, western and southern Illinois, Missouri, southeastern Nebraska and southwest through much of Oklahoma and Texas.

Copperheads, Missouri's most common venomous snakes, have produced more fear, questions and myths than any other snakes. Will you die if bitten by a copperhead? Do copperheads always travel in pairs? Will they attack people? Do they have any value in the wild? The facts presented here will help you understand copperheads and, we hope, be less fearful of them.

There is not just one kind of copperhead; North America actually has five geographic races or subspecies, which differ in coloration and distribution. One western subspecies even ranges into extreme northern Mexico. Missouri is at a crossroads between several of these subspecies.

Those living in extreme southern Missouri have characteristics of the southern copperhead. The Osage copperhead lives throughout the rest of the state, except for a few counties bordering Iowa. There are blends or intergradations of these races in southern and eastern Missouri.

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Coloration

Missouri's copperheads are pinkish tan with distinct, dark brown markings along their backs that are shaped like a bow tie or hourglass (pinched in the middle and wide on either side). Southern copperheads have more tan than pink in the background color, and their markings have less brown and are more constricted on the top. Osage copperheads usually have a light tan or white border around each dark marking against their pinkish tan background.

Newborn copperheads and those under two years of age are slightly paler, but they still have the same markings. Young copperheads have sulphur-yellow tails. This coloration is gone when they are 2 years old. Copperheads of all ages have a dark marking on the sides of the head bordered by a thin black line and a cream or white line. This

Copperhead markings allow them to blend into a variety of environments. Although they may look menacing, the snakes prefer flight to fight. However, they will bite to defend themselves.

marking and others along the back and sides help disrupt or break up the outline of their body and, along with their pinkish tan coloration, allow them to blend perfectly with the colors of dead leaves on the forest floor.

The name copperhead actually comes from the head color of the northern copperhead, which lives in southern New England, Pennsylvania, Ohio and into the Appalachian Mountain states. Northern copperheads have a slightly orange or copper-colored head, but this coloration seldom holds true for those living in Missouri. Most of Missouri's copperheads have a head color that's about the same pinkish tan as their body, but the copperhead name still stands. Their cream-colored belly has large, gray blotches along the edges that extend up slightly onto the sides.

Size

Copperheads are considered medium-sized snakes and average 24 to 36 inches long. Adult male copperheads generally grow to longer lengths than females. Thus, a copperhead 36 or 39 inches long is likely a large male. Copperheads may reach a maximum length of over 43 inches.

Habitats

The Osage copperhead lives in open forests along creeks, on rocky, southeast-, south- or southwest-facing hillsides and near abandoned farm buildings, abandoned saw mills and discarded woodpiles. Copperheads will live under lumber piles, discarded corrugated roof tin or other objects near abandoned farm buildings. The southern copperhead has a tendency to live close to creeks, rivers, river backwaters and swamps. Missouri has abundant natural and manmade habitats where copperheads can live and thrive.

Reproduction

All North American pit vipers give birth to live young (they don't lay eggs). Many nonvenomous snakes also produce live young, including water snakes, garter snakes and several species of small, woodland snakes. Actually, about half of Missouri's 51 kinds of snakes produce eggs (all nonvenomous) and half produce live young, including our five venomous species.

Female copperheads can produce a litter ranging from one to a maximum of 20, with four to seven young being a common litter size, in late August through September. Research in Kansas showed that female copperheads may produce a litter of young for two years, then may go several years without reproducing. Newly born copperheads are 7 or 8 inches long. The young resemble adults, although their background color is lighter and their markings are a lighter brown.

Copperhead Diet

We know young copperheads eat small lizards, such as skinks and fence lizards, and frogs. There are reports of young and adult copperheads eating cicadas—either nymphs or newly transformed adults. And, if the opportunity is there, young copperheads will eat small mice.

Young copperheads have a characteristic that few people notice: The last inch or so of their tails are greenish yellow with 8 or 10 small, white markings edged in black. Their colorful tails have an important use: they help them capture prey. If a small lizard or frog ventures within a few feet of a coiled baby copperhead, the copperhead will move its tail near the center of its coil, elevate it slightly and begin to wiggle or undulate the tail. To a hungry lizard or frog that moving tail tip may look like a green caterpillar.

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A quick strike injects deadly venom into prey, which a copperhead then eats whole.

If the prey animal pursues the squirming "insect," the copperhead will grab it, inject a little venom and have a meal. Technically this is called caudal-luring—caudal meaning tail and luring meaning 'come over here please.' After about 18 months to two years, copperheads are able to capture larger prey and their tails become less colorful.

Over 90 percent of an adult copperhead's diet consists of mice, especially deer mice and voles. Copperheads also eat other rodents, such as house mice and young chipmunks. Snakes, including venomous species, have a role or job description as part of the checks-and-balance system of nature and should be valued as a primary, natural controller of destructive rodents.

Adult copperheads and other pit vipers are sit-and-wait predators: They locate a mouse trail, coil near it and wait until a mouse happens by. During the summer this may take place at twilight, during the night or in early morning. Copperheads may also ambush prey that enters the snake's hiding place, such as under a flat rock or piece of corrugated roof tin lying on the ground.

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Venom, Fangs and Humans

The copperhead's venom glands, venom ducts, fangs and venom evolved to allow them to kill mice and other prey animals. They bite a prey animal, inject venom, then quickly release the prey. The mouse or other prey dies in minutes and all the snake has to do is follow the odor trail and eat the freshly killed rodent. By using venom, the snake does not have to struggle with the prey and risk injury to itself. A copperhead's venom apparatus, however, also is used for protection.

A copperhead will likely bite a person who steps on it because it is trying to defend itself. This type of bite is not

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The lower jaw of a copperhead is loosely joined to the skull and the upper jaws are moveable, allowing the snake to engulf food three times larger than its head.

that common. Most bites occur when someone sees a copperhead and decides to capture or kill the snake. During such scenarios the copperhead will do its best to defend itself.

In Missouri, no person has died as a result of a copperhead bite. In an average year, venomous snakes bite approximately 200 people in this state, with the majority involving copperheads. In over 25 years there are no records of a person dying from the bite of any venomous snake species native to Missouri. A person bitten by a copperhead should be taken to the emergency room of the nearest hospital to prevent infection and reduce pain, not because he or she is going to die.

This two-day old Osage copperhead, like all newborn copperheads, has a yellow tail. The young snakes use their yellow tail tip, which may look like a caterpillar, to lure their lizard and frog prey.

The bite of a copperhead usually produces immediate, intense, burning pain. This may be followed by tingling or throbbing and nausea. In a few minutes there may be signs of swelling on the arm or leg. The most important thing is to immediately take the victim to a hospital emergency room. Various first-aid measures, such as applying a tourniquet or cutting and sucking out the venom or applying ice packs, are not recommended for copperhead bites.

In addition, according to emergency-room physicians, copperhead bites are seldom treated with antivenom, the medication that counteracts the affects of snake venom. This medication can cause a serious allergic reaction that can cause human death.

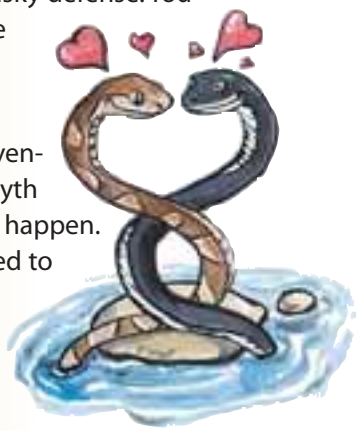
The majority of venomous snake bites can be prevented simply by not trying to capture or handle copperheads or other venomous snakes. Copperheads, by nature, are not aggressive. They do not go after people, do not search for people to bite and would rather stay motionless and undetected or try to avoid an intruder.

Copperhead Myths

Copperheads smell like cucumbers. You may have heard someone say you always know when a copperhead is around because it smells like cucumbers. This is both true and misleading.

Yes, copperheads and most other kinds of snakes give off an offensive odor when molested, cornered or captured. This defensive odor, produced by glands at the base of the tail, is given off at will and may also be mixed with feces. To some individuals this musk may smell somewhat like cucumbers.

However, a snake has to have a reason to expel its musk. Thus, a copperhead at rest under a rock or alongside a log will have no reason to give off its musky defense. You could walk within a few inches of the snake and never know it's there.



Black snakes breed with copperheads during floods and produce venomous black snakes. Not true. This myth has no biological basis and does not happen. Black rat snakes are not closely related to copperheads and have no interest in breeding with the venomous copperhead. Such a union would not produce viable offspring.

Copperheads always move in pairs—if you see one you will find another. Not true. Copperheads are competing with each other for food and shelter. If they remain together, their chances of finding enough prey to eat is reduced. If copperheads are found together it is because the habitat is ideal and may sustain more than one snake, or the site may be an overwintering den.

Baby copperheads are more dangerous than adults. Not true. There is no biological reason for baby copperheads to have more potent venom than adults. They have smaller venom glands, tiny fangs and are not capable of producing a venom more potent than adult copperheads.

For the facts on Missouri's snakes get a copy of the revised and expanded second edition of The Amphibians and Reptiles of Missouri. *Order from the MDC Nature Shop, P.O. Box 180, Jefferson City, MO 65102, or call: 573/751-4115, ext. 3325.*

Living Peacefully with Copperheads and Other Snakes

Snakes aren't out to get you!

Many people have such a fear of copperheads and other snakes that they avoid going outdoors to fish, hunt, hike or picnic. In addition, many harmless snakes are needlessly killed each year out of fear. But copperheads and most other snakes are shy and normally avoid people. As those who spend a lot of time in the outdoors know, encounters with snakes are rare.

Snakes are just as much a part of Missouri's outdoors as deer, wild turkeys or bluebirds. Learning about the behavior and natural history of snakes provides insights to understanding the natural world, on which we all depend.

Missouri snake species

Missouri is home to 51 different species and subspecies of snakes. The majority (88%) of our snakes are harmless. Snakes are important in maintaining balance in the natural world: They eat many rodents and other animals and, in turn, serve as a food source for wildlife such as hawks, owls, mink, skunks and herons. Snakes, which have lived in Missouri far, far longer than people, have adapted to a variety of natural communities, from parched glades to wetlands.

Snakes are reptiles—a group that also includes crocodiles, turtles and lizards. Reptiles have been around for millions of years. They are covered with scales and are the same temperature as their surroundings. Snakes and lizards are closely related. Snakes are legless, have no external ear openings and are not slimy. About half of our snakes lay eggs; half give birth to completely developed young. All snakes shed their outer skin as they grow—from three to five times per year. All snakes can swim. The internal organs of snakes are elongated, which allows them to fit into the tubular body cavity. Most species have an elongated right lung and no left lung.

All snakes eat other animals and are classified as carnivorous. Kingsnakes, for example, eat mice, lizards and other species of snakes. They are immune to the venom of our venomous snakes and will kill and consume them if given the opportunity. Although many of our harmless snakes will bite to defend themselves, their bite usually produces nothing more than simple scratches.

Snake conservation

Few Missourians realize that all snakes native to our state are protected. The *Wildlife Code of Missouri* treats snakes, lizards and most turtles as nongame species. This means that there is no open season on these animals, and it is against the law to kill them. An exception to this rule is when a venomous snake in close association with people might result in someone being bitten.

Helping snakes survive

In addition to halting needless killing of snakes, snake survival means protecting and providing proper habitat. In general, a diversified habitat such as a well managed forest will support a variety of both game and nongame species of animals. Snakes in such an environment will benefit from the addition of various kinds of shelters, such as brush piles, logs and rock piles. These shelters will provide security for snakes and may increase the availability of food animals (mice, native rodents, lizards, toads and frogs). Ponds built near forested areas also will benefit several kinds of snakes and other wildlife as long as the pond is properly maintained.

The Department of Conservation can provide landowners with detailed wildlife management tips. For more information, write to: Missouri Department of Conservation, P.O. Box 180, Jefferson City, MO 65102 or call: 573-751-4115. Missourians who have a particular interest in the conservation of our amphibians, snakes and other reptiles can join one of Missouri's regional herpetological organizations. To find out if there is such an organization near you, contact the address above.

Avoiding snakes

Even though snake bites are rare, you can reduce your chance of snake bite by taking the following precautions.

Stay away from areas where there may be a concentration of venomous snakes. Wear protective footwear in habitats where dangerous snakes may occur. Never place your hands under rocks or logs; do not step over rocks or logs. Step on them first, then over. When walking in a forest, step lively. Look the ground over when you stop to stand or sit, particularly around large rocks or logs. Pit vipers are most active in late evening and at night; be extra careful during these times. Wear rubber boots when fishing in streams or swampy areas that may harbor the venomous cottonmouth.

One more caution: Avoid any snake you cannot identify. Most species of venomous snakes are shy and normally

avoid people. When encountered in the wild they usually try to escape detection by remaining motionless. Often, an individual that is provoked will try to escape rather than defend itself. Once cornered, however, these snakes will do their best to defend themselves.

Too close to home

Although snakes are an interesting and natural part of our outdoors, there may be times and places where their presence is objectionable. Venomous snakes are not desirable around human dwellings. It is possible to discourage snakes around homes by eliminating their food and shelter. Piles of boards, fence posts, dump heaps, roofing paper, scrap corrugated steel roofing, railroad ties, slabs of bark and piles of rocks provide hiding places for snakes and the food they eat. Removing these attractions and generally tidying up are the best ways to keep a premises free of snakes. Inspect foundations, doors and low windows to make sure there are no openings where snakes might enter. We recommend that any harmless snakes encountered be captured with a hoe or stick and released unharmed in an isolated, safe habitat. ▲

Missouri's Other Venomous Snakes

The four other venomous snakes native to Missouri besides copperheads also are members of the pit viper family. Pit vipers have a characteristic pit located between the eye and nostril on each side of the head, which detects the body heat of a small mammal or bird. Their pupils are elliptical in shape, and they have a pair of well developed fangs. Our venomous species all have a single row of scales along the underside of the tail.

Many people insist on using the triangular shape of the head to determine whether a snake is dangerous or harmless, but this is not a good way to identify these snakes. Although venomous snakes have a somewhat triangular head, several harmless species, like water snakes, garter snakes and the hog-nosed snake, can flatten their head, which causes them to appear triangular. Harmless snakes lack the sensory focal pit and fangs. They have round pupils and a double row of scales along the underside of their tail.

The venomous snakes found in Missouri are the Osage and southern copperhead, western cottonmouth, western pygmy rattlesnake, eastern massasauga rattlesnake and timber rattlesnake. The diamondback rattlesnake and coral snake are not found in Missouri. The most common venomous snake in Missouri is the copperhead. There is no record of a human death caused by a copperhead bite in this state.

Snakebite is not a serious problem in Missouri. For those who like to read numbers, compare the following statistics for 1998 Missouri resident accidental deaths:*

Snake Bite	**0**
Drowning	**105**
Vehicular	**1,159**
Aviation	**15**
Lightening	**1**
Insect	**0**
Spider	**2**
Agriculture	**27**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western pygmy rattlesnake


Tom R. Johnson
eastern massasauga rattlesnake


Tom R. Johnson
western cottonmouth


Tom R. Johnson
timber rattlesnake

*Information courtesy of the Missouri Department of Health

Are you sure it's a copperhead?

Too often, any snake with brown or red markings is thought to be a copperhead and is killed. There are five common harmless Missouri species often confused with and misidentified as copperheads:

Hatchling black rat snakes are found throughout Missouri. During late summer and early fall, young black rat snakes average 10 inches in length and are sometimes spotted in backyards, garages or basements. They have a narrow head and gray background color with black markings. Copperheads have a wide head and are pinkish tan with brown, hourglass-shaped markings.

Hatchling and adult prairie kingsnakes range throughout Missouri. In the fall, hatchling prairie kingsnakes are often found near homes and outbuildings. They average 8 inches in length. Young prairie kingsnakes have a narrow head and a grayish brown background color with reddish brown, round markings. Copperheads have a wide head and are pinkish tan with brown, hourglass-shaped markings.

Adult prairie kingsnakes average 3 to 4 feet in length and have a narrow head. Their coloration is nothing like the copperhead, which has a stockier body and is pinkish tan with brown markings in the shape of an hourglass or butterfly (pinched on top and wide on either side).

Eastern hog-nosed snakes are found throughout Missouri. This species may have a wider head and a stockier body than most nonvenomous snakes. Although their coloration is extremely variable, a hog-nosed snake never has a pinkish tan color with markings in the shape of an hourglass or butterfly. When threatened, hog-nosed snakes can make a loud hissing noise; copperheads are not able to make extended hissing sounds.

The bullsnake was once common in our former tallgrass prairie counties and is Missouri's largest species of snake, reaching nearly 8 feet in length. Bullsnakes have narrower heads than copperheads, and their mixed colors of cream, yellow, tan, brown and black suits them for a life in prairie grasses. Copperheads, on the other hand, are pinkish tan in color with brown markings in an hourglass or butterfly shape. When threatened, bullsnakes also can make a very loud hissing sound, which copperheads are incapable of making.

The red milk snake is Missouri's smallest kingsnake (21 to 28 inches in total length) and lives on rocky, open hillsides. It has prominent red markings.


hatchling black rat snake

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adult prairie kingsnake

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eastern hog-nosed snake

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bullsnake

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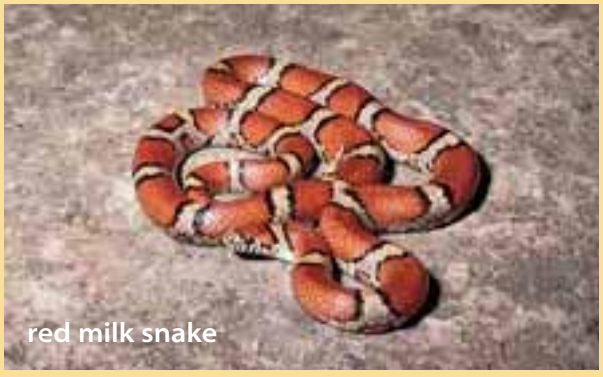
red milk snake

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